Green power generation from environment friendly sources

1180. SHRI SANTOSH BAGRODIA: Will the Minister of NON CONVENTIONAL ENERGY SOURCES be pleased to state:

(a) whether Government have convened a meeting with the Sever North Eastern States and the Government of Sikkim in July at Calcutta in connection with a policy on power generation from renewable energy rcsoucres;

(b) if so, whether meeting was part of the Government's initiative to boost 'green' power generation from environment friendly sources; and

(c) if so, the details thereof?

THE MINISTER OF STATE OF THE MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES (SHRI M. KANNAPPAN): (a) to (c) The Ministry of Non-Conventional Energy Sources has convened a meeting at Calcutta with the officials of Power Departments. State Electricity Boards and State Nodal Agencies of the North Eastern States and Sikkim in connection with the formulation of a common policy for private sector participation in commercial non-conventional power projects in those States. This is part of the efforts to boost power generation in the country from environment friendly sources such as solar, wind, biomass and small hydro.

Solar Energy Programme

1181. SHRI VEDPRAKASH P. GOYAL: Will the Minister of NON-CONVENTIONAL ENERGY SOURCES be pleased to state:

(a) whether it is a fact that the Solar Energy Programme is regarded as one of the World's largest programme, if so, the countries which are following the similar kind of programmes:

(b) what arc the highlights of the Solar Energy Programme in other countries:

(c) if the programme is commercially viable in other countries, what is the cost incurred thereon: and

(d) what is trie difference in the level of technologies used in India and other countries?

THE MINISTER OF STATE OF THE MINISTRY OF NON-CONVENTIONAL ENERGY SOURCES (SHRI M. KANNAPPAN): (a) and (b) The Indian solar energy programme is regarded as one of the largest national programmes in the world in this field. Other countries which have policies to support solar energy development as well as major programmes in solar photovoltaic and thermal technologies include USA, Japan, Germany, China, Australia, France, Netherlands, Austria, Israel, Italy and Spain.

USA is pursuing the development and utilization of a variety of solar technologies for a large number of applications. A programme for the installation of 1 million solar systems on roof-tops of houses and other buildings was announced in 1997. This includes solar photovoltaic systems for electricity generation as well as solar thermal systems for water heating. In Germany, a new programme for 100,000 solar roofs was launched in 1999. About 33,000 roof-top photovoltaic systems have been installed in Japan till March 2000 under its national programme. In Israel, legislation has made it mandatory to install solar water heaters in several types of buildings including most residential untis. Megawatt-size power plants based on solar thermal and photovoltaic technologies have been installed in USA. Photovotaic power plants have also been installed for purposes of demonstration and evaluation in several other countries including Italy, Germany and Japan, Research and development is also being supported in Japan, USA, Australia and several European countries.

(c) The commercial viability of any solar energy system depends on a number of factors such as the solar radiation level, load, consumption pattern and the availability and cost of electricity or fossil fuels. The cost of electricity from solar thermal or photovoltaic systems is generally not competitive to that generated from conventional energy sources. The megawatt-size power plants abroad have been built either under government*funded demonstration programmes or by availing of special tax benefits and other incentives. The solar roof programme in Japan is supported by government subsidies; in Germany it is supported by soft loans and a special price for the electricity supplied to the grid by house owners. The international price for photovoltaic modules is around $ 4 per watt and the cost of electricity for stand-alone systems varies between

25 to 50 cents per kilowatt hour. However, photovoltaic power can be economical in remote and unelectrirled areas and for small power applications, as is also the case in India.

Solar water heating systems for household use are considered to be commercially viable in most countries including India. The cost of a *solar water* hearing system of 100—120 litre capacity varies between $ 400—600. Industrial and institutional solar water heating systems are competitive only if the alternative is electricity or a high-priced fuel.

(d) As a result of development and commercialisation efforts made during the past two decades, a substantial base for the manufacture of solar photovoltaic and solar thermal products has been established in India. Almost the entire production of solar ceils in India *is* based on the single crystal silicon technology. Technologies such as multi-crystalline silicon, amorphous silicon and other thin film solar cells which account for over 60% of the world's production are not yet in commercial production in India. Nevertheless, solar cells and modules made in India are being exported to several countries abroad. Solar collector material for thermal applications is also being exported *from* India. Several Indian companies have obtained the ISO 9000 quality certification.

The main difference in the production of solar products in India and some other countries lies in the volume of production and the range of technologies employed. Leading foreign companies have production capacities which are 5 to 10 times that of Indian companies. A higher level of automation is also seen in foreign manufacturing organizations.

Central Grant for Solar Energy is Bihar

† 1182. SHRIMATI KUM KUM RAI: Will the Minister of NON-CONVENTIONAL ENERGY SOURCES be pleased to state:

(a) the quantum of Central grant released for the development of solar energy in Bihar during 1998 to 2001; and

† Original notice of the question was received in Hindi.